



Hot AL RAM 52 PCR 2

OUTLINE

To: Memo File

From: Gorley Lau [REDACTED]

Date: [REDACTED]

Re: R52 Hot AL

PCR 2 Meeting Presentation

1-1: [REDACTED]

CTI: [REDACTED]

CMI: [REDACTED]

- Memo Log
- Executive Summary
- Scorecard
- Reasons For Change/Options Considered
- Key Technical Focus for this Module
 - Objective Specs/X-Section Comparison
 - Objective Spec Windowing
 - Recipe Windowing
 - E-Test/Yield
- Schedule and Resources
- Signoff/AR's



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Memo Log

Deliverable	What was learned	Memo #
Objective Specs Defined/ Target Windowed	Can fill 0.27-0.37 um CD and 4k ILD	
Critical Recipes Windowed	All critical parameters are windowed with 470C heater temp	
Defects		
IVM Critical Variables Define Locked or Monitored	Critical variables defined, locked, & monitored	
Etest/Yield	New recipe = baseline recipe 4k ILD yield = control	
Roadmap update	Have functional IMP Ti + Hot Al recipe with good yield	
Technical Knowledge	No functional recipe for 0.27 um CD & 5k ILD at 470C	



Executive Summary

- **What this is**
 - PCR2 review for hot aluminum process on RAM52W Metal 1
 - The hot aluminum process has replaced W plug process for Metal 1 contact for R52
 - Key Measurement: Hot Al contact fill, Etest, and Yield
- **Summary Status**
 - PCR 2 for this module is on schedule with no fundamental technical problems for current R52 objective specs
 - New Hot Al recipe meets all objective specs
 - Etest and yield results confirmed that new recipe can fill 0.27 um CD with 5k ILD contacts at 480C
 - [REDACTED]
- **What This Means**
 - We have a process that works for current R52 objective spec using CoTi as wetting layer
 - [REDACTED]
 - R52 Hot Al recipe is different from R32/R42 recipe (lower hot step power)
 - [REDACTED]



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Scorecard

Deliverable	Req'd	Actual	Pass
Objective Specs Defined	100%	100%	P
Objective Specs Targeted	100%	100%	P
Objective Specs Windowed	100%	100%	P
Specs: Technology	100%	100%	P
Specs: Fab	100%	100%	P
Critical Recipes % Windowed	100%	100%	P
IVM % Defined	100%	100%	P
IVM % Locked/Monitored	0%	100%	P
Yield	=	=	P
Technical Knowledge/Risk Assessment	Update	Done	P
Module Roadmaps	Update	Done	P
Fab Equipment Roadmaps	Update	Done	P



Reason For Change / Options Considered

	Option 1	Option 2	Option 3	Option 4
Recipes	R32/R42 Hot Al	Current R52 Hot Al	New R52 Hot Al	IMP Ti / Hot Al
Sputter Etch Time	90 sec.	90 sec.	90 sec.	45 sec.
Wetting Layer (Thickness)	CoTi (500A)	CoTi (350A)	CoTi (500A)	IMP Ti (500A)
Cold Al Thickness	2500A	1000A	2500A	2500A
Hot Al Power	800W	800W	400W	800W
Hot Al Dep Time	180 sec.	240 sec.	180 sec.	180 sec.
Dep Temp to Fill 4k ILD	480C	480C	470C	480C
Dep Temp to Fill 5k ILD	Not Fill	Not Fill	480C	480C
Correct Config.	Yes	Yes	Yes	No
Comment	Work for 4k at 480C	Very different recipe Work for 4k at 480C	Work for 5k, most robust	Not ready for manufacturing

- What does this mean?

- New Hot Al recipe is ready and robust